

**MATCHING LAYER ASSEMBLY FOR A
DOWNHOLE ACOUSTIC SENSOR**

ABSTRACT OF THE DISCLOSURE

An acoustic sensor for use in a downhole measurement tool is provided. The acoustic sensor includes a piezoelectric transducer and a matching layer assembly having at least one matching layer and a barrier layer. In various exemplary embodiments, the at least one matching layer includes first and second matching layers formed from a glass ceramic work piece and the barrier layer includes corrugated titanium. Exemplary embodiments of this invention may advantageously withstand the extreme temperatures, pressures, and mechanical shocks frequent in downhole environments and thus may exhibit improved reliability. A method for fabricating an acoustic sensor is also provided.